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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,703	06/25/2003	Hector Cotal	PD 02-0304/11881 (21797-0)	3427
26587	7590	04/19/2006	EXAMINER	
MCNEES, WALLACE & NURICK LLC 100 PINE STREET P.O. BOX 1166 HARRISBURG, PA 17108-1166			FICK, ANTHONY D	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/603,703	Applicant(s) COTAL ET AL.	
	Examiner Anthony Fick	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/25/03 5/18/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 4 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Takada et al. (U.S. 6,291,761).

Takada discloses a solar cell module, shown in figures 3A, 3B, and 3C. The module comprises a photovoltaic energy source, 303, having a front face and an oppositely disposed back face, the top and bottom of the layer as seen in figure 3B, a frontside array of metallic gridlines, 305, and a busbar structure in electrical continuity with the frontside array comprising an electrical insulator layer, 308, and a metallic busbar layer, 306, which overlies the insulator layer and is in electrical continuity with the frontside array of metallic gridlines (figure 3A, 3B, and 3C and column 17, paragraphs 2 and 6 and column 18, paragraph 1). Thus claim 1 is met. Takada further discloses the photovoltaic energy source comprises more than two layers of semiconductor material (column 17, paragraph 2) as in claim 3. Figure 3B further shows a backside metallic electrode, 301, overlying and contacting the back face of the energy source as in claim 4 (column 16, paragraph 8). Figure 3A also shows the insulator layer, 308, extends laterally beyond the metallic busbar, 306, as in claim 8.

Art Unit: 1753

3. Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ichinose et al. (U.S. 6,051,778).

Ichinose discloses a photoelectricity-generating device as shown in figures 2, 3 and 4. Figure 3 shows the photovoltaic energy source having a front and back face, 200. Figure 2 shows an array of metallic gridlines deposited on the front face of the photovoltaic energy source, 208, and a busbar structure comprising an insulator layer, 210, and a metallic busbar layer, 209, overlying and contacting the insulator layer. Figure 4 further shows the busbar is in electrical continuity with the array of metallic gridlines, 208, thus meeting claim 1. Figure 2 also shows more than two layers of semiconductor material within the photovoltaic energy source (column 8, paragraph 7) as in claim 3. Ichinose further discloses the insulator layer can include a film of insulating material such as oxides or nitrides (column 9, paragraph 8) as in claim 5.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 5, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada as applied to claims 1, 3, 4 and 8 above, and further in view of Mowles (U.S.P.G.Pub 2002/0062858).

The disclosure of Takada is as stated above for claims 1, 3, 4 and 8.

The differences between Takada and claims 2, 5, 6 and 7 are the requirement of exactly two layers of semiconductor material, and requirements of the insulator layer composition and thickness.

Mowles teaches a high efficiency solar cell produced with inexpensive materials. The photovoltaic layer comprises two semiconductor layers to produce a p/n junction (paragraph 0052). Mowles further teaches the use of an insulating layer to electrically isolate the device. The insulating layer is made of silicon dioxide and has a thickness of 0.5 micrometers (paragraph 0049).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the semiconductor materials and two layer structure of Mowles within the device of Takada because the material is low cost, efficiently absorbs the solar spectrum, efficiently transports the photogenerated carriers and provides the abrupt p/n junctions needed for an efficient photovoltaic device (Mowles paragraph 0052). Further the amorphous silicon utilized within the device of Takada has a short lifetime, difficult production and increased cost over the material of Mowles (Mowles paragraph 0012). Because both Takada and Mowles are concerned with solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets claim 2.

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to utilize the material and thickness of the insulating layer of Mowles within the device of Takada because silicon dioxide has low cost, high availability of source chemicals and advanced technology of its deposition (Mowles

Art Unit: 1753

paragraph 0049). Also the thickness is optimized for the specific application of an insulating layer and needs only to be sufficiently thick enough to be electrically insulating and pin-hole free (Mowles paragraph 0049). Thus the thickness of Mowles provides a low cost insulating layer free of defects that can corrupt the insulating properties of the layer. Therefore the combination meets claims 5 through 7.

6. Claims 9 through 12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada as applied to claims 1, 3, 4 and 8 above, and further in view of Kaplow et al. (U.S. 4,242,580).

The disclosure of Takada is as stated above for claims 1, 3, 4 and 8.

The difference between Takada and claims 9 through 12, 16 and 17 is the requirement of a solar concentrator of specific concentration ratio.

Kaplow teaches a solar radiation collection apparatus. The apparatus directs highly concentrated solar radiation upon a device such as a photovoltaic cell (abstract). These concentrations exceed 100 suns and especially in the range of 500 or more suns (column 1, paragraph 1). Figure 1 shows the apparatus concentrates the solar energy toward the front face of solar cell 10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the solar concentrator of Kaplow with the device of Takada because the device allows the response of the cell to sun exposure to always be a maximum (Kaplow column 6, paragraph 2) and provides highly concentrated solar radiation to the solar cell (Kaplow column 2, paragraph 10). Because Kaplow and Takada are both concerned with photovoltaic cells, one would have a reasonable

Art Unit: 1753

expectation of success from the combination. Thus the combination meets claims 9 through 12, 16 and 17.

7. Claims 13 through 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada in view of Kaplow as applied to claims 9 through 12, 16 and 17 above, and further in view of Mowles (U.S.P.G.Pub 2002/0062858).

The disclosure of Takada in view of Kaplow is as stated above for claims 9 through 12, 16 and 17.

The differences between Takada in view of Kaplow and claims 13 through 15 are the requirements of the insulator layer composition and thickness.

Mowles teaches a high efficiency solar cell produced with inexpensive materials. The photovoltaic layer comprises two semiconductor layers to produce a p/n junction (paragraph 0052). Mowles further teaches the use of an insulating layer to electrically isolate the device. The insulating layer is made of silicon dioxide and has a thickness of 0.5 micrometers (paragraph 0049).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the material and thickness of the insulating layer of Mowles within the device of Takada in view of Kaplow because silicon dioxide has low cost, high availability of source chemicals and advanced technology of its deposition (Mowles paragraph 0049). Also the thickness is optimized for the specific application of an insulating layer and needs only to be sufficiently thick enough to be electrically insulating and pin-hole free (Mowles paragraph 0049). Thus the thickness of Mowles provides a low cost insulating layer free of defects that can corrupt the insulating

Art Unit: 1753

properties of the layer. Because Mowles and Takada in view of Kaplow are all concerned with solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets claims 13 through 15.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anthony Fick *ADF*
AU 1753
April 14, 2006


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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700